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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte XIAORU WANG,
DAVID B. BAILEY,
YONGCAI WANG,
and EDWARD SCHOFIELD

Appeal 2008-4955
Application 10/686,825
Technology Center 1700

Decided: November 28, 2008

Before CHARLES F. WARREN, CATHERINE Q. TIMM, and KAREN M. HASTINGS, *Administrative Patent Judges*.

TIMM, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's decision rejecting claims 1-2, 4-7, and 9-15. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

STATEMENT OF THE CASE

The invention relates to a solvent based ink composition containing composite colorant particles that have a colorant phase and a polymer phase, which have improved dispersion characteristics. (Spec. 1, ll. 13-16). Claims 1, 2, 12, and 15 are illustrative of the subject matter on appeal:

1. An organic solvent based ink composition comprising more than 60 % by weight of an organic solvent and composite colorant polymer particles, wherein said composite colorant polymer particles have a colorant phase, which comprises pigment, and a polymer phase, said polymer phase of said particles being formed in situ in the presence of said colorant, said composite colorant polymer particles having a mean particle size of less than about 200 nm.

2. The composition of Claim 1 wherein said composite colorant polymer particles are made by a process comprising, in order:

I) suspending in an aqueous medium, under agitation, finely divided colorant particles to form an aqueous colorant mixture;

II) adding to said aqueous colorant mixtures an addition polymerization initiator before introducing a monomer mixture used to form the polymer phase; and

III) causing said addition polymerization initiator to form a free radical while continuously introducing to said aqueous colorant mixture a monomer mixture comprising:

a) an addition polymerization initiator, and

b) at least one ethylenically-unsaturated monomer;

thereby forming said composite colorant particles having a colorant phase and a polymer phase.

12. The composition of Claim 1 wherein said colorant phase of said composite colorant particles has a mean size of less than about 80 nm and said polymer phase has a weight average molecular weight of greater than about 5000.

15. An organic solvent based ink composition comprising more than 60 % by weight of an organic solvent and composite colorant polymer particles, wherein said composite colorant polymer particles have a colorant phase, which comprises pigment, and a polymer phase, said polymer phase of said particles being formed in situ in the presence of said colorant, said composite colorant polymer particles having a mean particle size of less than about 200 nm, wherein said composite colorant polymer particles are made by a process comprising, in order:

I) suspending in an aqueous medium, under agitation, finely divided colorant particles to form an aqueous colorant mixture;

II) adding to said aqueous colorant mixture an addition polymerization initiator before introducing a monomer mixture used to form the polymer phase; and

III) causing said addition polymerization initiator to form a free radical while continuously introducing to said aqueous colorant mixture the monomer mixture comprising:

a) an addition polymerization initiator, and

b) at least one ethylenically-unsaturated monomer;

thereby forming said composite colorant particles having a colorant phase and a polymer phase.

The Examiner relies on the following prior art references to show unpatentability:

Miyabayashi et al.	US 6,271,285 B1	Aug. 7, 2001
Cooke et al.	US 6,458,458 B1	Oct. 1, 2002

Adams	US 2002/0147252 A1	Oct. 10, 2002
Ishii et al.	US 6,843,553 B2	Jan. 18, 2005

The Examiner maintains the following rejections:

1. Claims 1, 2, 5-7, 9-10, and 12-15 rejected under 35 U.S.C. § 103(a) as obvious over Ishii et al. ("Ishii");

2. Claim 4 rejected under 35 U.S.C. § 103(a) as obvious over Ishii (as applied to claims 1, 2, 5-7, 9-10, and 12-15) in view of Adams; and

3. Claim 11 rejected under 35 U.S.C. § 103(a) as obvious over Ishii (as applied to claims 1, 2, 5-7, 9-10, and 12-15) in view of either Miyabayashi et al. or Cooke et al.

Appellants provide arguments under separate headings for claim 1, claims 2 and 15 as a group, and claim 12. Appellants provide no separate arguments for any of the other pending dependent claims. We elect claim 2 to represent the group of claims 2 and 15 proposed by Appellants.[1] *See* 37 C.F.R. § 41.37(c)(1)(vii)("When multiple claims subject to the same ground of rejection are argued as a group by appellant, the Board may select a single claim from the group of claims that are argued together to decide the appeal with respect to the group of claims as to the ground of rejection on the basis of the selected claim alone."). Thus, we decide this appeal on the basis of claims 1, 2, and 12

[1] Claims 2 and 15 are identical in scope. Claim 15 is merely claim 2 written in independent form.

A. *Claims 1 and 2*

1. ISSUE ON APPEAL

Claim 1 recites that the polymer phase of the particles is "formed in situ in the presence of said colorant." (*See* Claim 1). Claim 2 recites a process for making composite colorant polymer particles in situ. (*See* Claim 2). The Examiner contends that the product-by-process "in situ" language in claim 1 and the specifically recited steps in claim 2 do not structurally differentiate the claimed ink composition from that taught by Ishii. (Ans. 4, 5, and 10).

Appellants contend that an in situ process, specifically the process recited in claim 2, produces a product structurally different from the product taught by Ishii. (App. Br. 4). Appellants direct us to the experimental data in Table 2 of the Specification as evidence of structural differences. (App. Br. 4 and 6; Reply Br. 2-3).

Therefore, a first issue on appeal arising from the contentions of Appellants and the Examiner is: does the data provided in Table 2 of the Specification sufficiently demonstrate that the in situ process recited in claim 1 and detailed in claim 2 produces a product that is structurally different from the product taught by Ishii? We answer this question in the negative.

2. FACTUAL FINDINGS

The evidence of record supports the following Findings of Fact (FF):

1. Examples 1-9 in Appellants' Specification were prepared according to an in situ process, as recited in claim 1, and according to the specific process recited in claim 2. (Spec. 10, l. 20 to 12, l. 11). Specifically, a pigment dispersion and a polymerization initiator are charged

to a reactor, followed by the addition of a monomer and additional polyermization initiator, to form a polymer coated pigment particle. (Spec. 11, ll. 9-20).

2. Control Example C-1 in Appellants' Specification was prepared as just a pigment dispersion, with no polymer component. (Spec. 12, ll. 13-15).

3. With respect to Control Example C-2 in Appellants' Specification, a polymer was prepared without the presence of a pigment dispersion. (Spec. 12, l. 16 to 13, l. 2).

4. Subsequently, for testing purposes, "a mixture" of the Control Example C-2 polymer and the pigment dispersion were dispersed in toluene, an organic solvent. (Spec. 13, ll. 22-24).

5. Control Example C-3 in Appellants' Specification was prepared in the same manner as Examples 1-9, with the exception that no polymerization initiator was added to the pigment dispersion in the reactor prior to adding the monomer. (Spec. 13, ll. 4-15).

6. Table 2 lists optical density readings at 630 nm for Examples 1-9, Control Example C-1, and Control Example C-2 after having been dispersed in toluene for 4 hours. (Spec. 14, ll. 1-6; Table 2). The optical density readings are used to determine dispersion characteristics of the colorant particles. A large degree of settling (i.e., a low optical density reading) is undesirable. (Spec. 13, 16-30; Table 2).

7. Table 2 shows Examples 1-9 with optical density readings of greater than 4, Control Example C-1 with an optical density reading of 0.30, and Control Example C-2 with an optical density reading of 2.2. (Spec. 14, Table 2).

8. An ink was made using mineral oil and the dispersions of Examples 1-9, Control Example C-1, and Control Example C-2. "[T]he stability of the ink was evaluated by measuring particle size." (Spec. 14, ll. 9-13). A larger particle size indicates a less stable ink. (Spec. 14, ll. 13 and 18-21).

9. Table 2 shows the ink from Control Example C-1, Control Example C-2 and Control Example C-3 having particle sizes of greater than 1000 nanometers. (Spec. 14, Table 2).[2]

10. Appellants' Specification indicates that "ink formulated from composite colorant polymer particles in accordance with the invention has good stability and dispersion characteristics as compared to inks using only pigment particles or pigment particles blended with polymer." (Spec. 14, ll. 18-21).

11. Ishii teaches that

> colored particles may be contained in resin particles for dispersion for the purpose of improving fixing property. When the colored particles are contained in resin particles for dispersion, pigments are generally covered with the resin materials of the resin particles for dispersion to make resin-covered particles, and dyes are generally used as colored particles by coloring resin particles for dispersion.

(Ishii, col. 21, ll. 50-57).

[2] While Table 2 provides a particle size measurement for Control Example C-3, the Specification only describes procedures for measuring the particle size for Control Example C-1 and Control Example C-2. (Spec. 14, ll. 9-15; Table 2). The Specification is silent regarding the particle size measurement for Control Example C-3.

12. Generally, Ishii teaches that "[i]t is preferred that resin particles for dispersion are contained with the above-described colored particles in the oily ink for use in the present invention for the purpose of improving the fixing property of the image after printing." (Ishii, col. 22, ll. 18-21).

13. Ishii teaches that colored particles contained in resin particles can be prepared in two ways: well-known mechanical pulverizing methods or polymerization granulation methods. (Ishii, col. 23, ll. 33-36).

14. With respect to the mechanical pulverizing methods, Ishii teaches two different techniques. (Ishii, col. 23, ll. 36-47).

15. In the first mechanical pulverizing technique, Ishii teaches

> a method wherein a coloring material and a resin are mixed, melted, kneaded and directly pulverized by any of well-known pulverizers, according to necessity, and the resulting fine particles are further dispersed together with a dispersion polymer by a wet disperser (e.g., a ball mill, a paint shaker, a KD mill, a Dyno mill, etc.).

(Ishii, col. 23, ll. 37-42).

16. In the second mechanical pulverizing technique, Ishii teaches "a method of kneading a coloring material which is a component of colored particles and a dispersion assisting polymer (or a covered polymer) in advance, pulverizing the obtained mixture and then dispersing the pulverized particles with a dispersion polymer." (Ishii, col. 23, ll. 43-47).

17. With respect to the polymerization granulation methods, Ishii teaches dyeing the resin particles made by a polymerization granulation method. (Ishii, col. 23, ll. 58-60).

18. In Example 1, Ishii teaches the preparation of a polymer in the form of a dispersed latex by adding a polymerization initiator to a solution of

a monomer (vinyl acetate) in a solvent (Isopar H). (Ishii, col. 25, l. 66 to col. 26, l. 16). The dispersed latex, a nigrosine (pigment) dispersed in a polymer, and other components were then "diluted with 1 liter of Isopar G" to form a black oily ink. (Ishii, col. 26, ll. 14- 55). Thus, Example 1 in Ishii uses a pigment to dye a polymer prepared by a polymerization granulation method.

3. PRINCIPLES OF LAW

We must consider the patentability of the product defined by the claim in light of the prior art, rather than the process for making it. *In re Wertheim*, 541 F.2d 257, 271 (CCPA 1976); *In re Brown*, 459 F.2d 531, 535 (CCPA 1972)("[I]t is the patentability of the *product* claimed and *not* of the recited process steps which must be established.").

It has long been held that "'[i]f the product in a product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.'" *SmithKline Beecham Corp. v. Apotex Corp.*, 439 F.3d 1312, 1317 (Fed. Cir. 2006) (*quoting In re Thorpe*, 777 F.2d 695, 697 (Fed. Cir. 1985)).

"Where a product-by-process claim is rejected over a prior art product that appears to be identical, although produced by a different process, the burden is upon the applicants to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product." *In re Marosi*, 710 F.2d 799, 803 (Fed. Cir. 1983). The evidence must be commensurate in scope with the claims. *Id.*

4. ANALYSIS

Applying the preceding legal principles to the Factual Findings in the record of this appeal, we determine that Appellants have not successfully rebutted the Examiner's prima facie case of obviousness.

Table 2 of Appellants' Specification describes the differences in dispersibility (or settling) of the composite colorant particles made by the claimed process (Examples 1-9) and comparative composite colorant particles made by two alternative processes (Control Example C-1 and Control Example C-2. (FF 1-7, and 10). Table 2 also describes the differences in stability (or lack of coagulation) of the composite colorant particles made by the claimed process (Examples 1-9) and comparative composite colorant particles made by three alternative processes (Control Example C-1, Control Example C-2, and Control Example C-3). (FF 1-5, and 8-10). However, Table 2 does not provide sufficient evidence to demonstrate the differences between the composite colorant particles taught by Ishii and the composite colorant particles claimed since none of Control Example C-1, Control Example C-2 or Control Example C-3 are made by the processes taught by Ishii for providing a resin-coated colorant particle.

Control Example C-1 does not include a polymer material. (FF 2). Thus, particles of Control Example C-1 are substantially different from the resin-covered colorant particles of Ishii, in which a colorant is "contained in" or "covered with" resin particles. (FF 11 and 12).

Ishii teaches three different processes for making a colorant particle "contained in" or "covered with" resin particles: two pulverizing techniques and a technique for dyeing polymer particles in a dispersion made by a polymerization granulation method. (FF 13-17). Neither Control Example

C-2 nor Control Example C-3 is made using any of the specific pulverizing techniques taught by Ishii. (FF 14-16). Thus, Appellants have not shown that colorant particles covered with a resin made by the pulverization techniques taught by Ishii are structurally different from the composite colorant particles made by the claimed process based on the data in Table 2.

Thus, Appellants have not sufficiently rebutted the Examiner's prima facie case of obviousness based on the data in Table 2.

B. *Claim 12*

1. ISSUE ON APPEAL

The Examiner contends that the particle size recited in claim 12 would have been obvious to one of ordinary skill in the art based on a teaching of average particle size in Ishii that overlaps the claimed range. (Ans. 15-16). However, Appellants contend that the Examples of Ishii teach a range of average particle size that is outside of the claimed average particle size range. (App. Br. 6).

Thus, a second issue on appeal arising from the contentions of Appellants and the Examiner is: does the Ishii reference teach a particle size range that overlaps the claimed particle size range recited in claim 12? We answer this question in the affirmative.

2. FACTUAL FINDINGS

The evidence of record supports the following additional Findings of Fact (FF):

19. Ishii teaches that "[t]he colored particles dispersed in the nonaqueous solvent according to the present invention inclusive of the resin particles, preferably have an average particle diameter of from 0.05 to 5

μm." (Ishii, col. 23, ll. 26-29). In other words, Ishii teaches a preferred average particle size of between 50 and 5000 nanometers.

20. However, Example 1 of Ishii describes particles having an average particle size of 0.23 μm, or 230 nanometers. (Ishii, col. 26, ll. 14-16).

3. PRINCIPALS OF LAW

A reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill in the art, including non-preferred embodiments. *Merck & Co v. Biocraft Labs.*, 874 F.2d 804, 807 (Fed. Cir. 1989). Disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or non-preferred embodiments. *In re Susi*, 440 F.2d 442, 446 n.3 (CCPA 1971).

A claimed invention can be rendered prima facie obvious by a prior art reference that discloses a range that touches the range recited in the claim. *In re Geisler*, 116 F.3d 1465, 1469 (Fed. Cir. 1997)(*citing In re Malagari*, 499 F.2d 1297, 1303 (CCPA 1974)). The burden then shifts to the Appellant to "establish 'the existence of unexpected properties in the range claimed'" or to "show 'that the art in any material respect taught away' from the claimed invention." *Id.*

4. ANALYSIS

The broadest disclosure of Ishii teaches an average particle size of 50 to 5000 nanometers for the resin-covered colorant particles. (FF 19). Although Example 1 in Ishii produces an average particle size of 230 nanometers (FF 20), the Example in Ishii does not teach away from the broader disclosure of 50 to 5000 nanometers. *Susi*, 440 F.3d at 446 n. 3.

Thus, Ishii teaches a desired average particle size range that overlaps the claimed particle size range recited in claim 12, i.e., less than about 80 nanometers. (*See* Claim 12). As such, the Examiner has established a prima facie case of obviousness, and the burden shifts to the Appellants to demonstrate unexpected properties of the claimed range or that Ishii teaches away from the claimed range. *Malagari*, 499 F.2d at 1303. Appellants provide no evidence of unexpected properties with respect to the claimed particle size and have not sufficiently demonstrated that Ishii teaches away from the claimed particle size range.

CONCLUSION

Appellants have limited the scope of their arguments to the above issues and do not further contest the Examiner's rejection of the claims. Therefore, we sustain the following rejections of the Examiner:

1. Claims 1, 2, 5-7, 9-10, and 12-15 rejected under 35 U.S.C. § 103(a) as obvious over Ishii;

2. Claim 4 rejected under 35 U.S.C. § 103(a) as obvious over Ishii (as applied to claims 1, 2, 5-7, 9-10, and 12-15) in view of Adams; and

3. Claim 11 rejected under 35 U.S.C. § 103(a) as obvious over Ishii (as applied to claims 1, 2, 5-7, 9-10, and 12-15) in view of either Miyabayashi et al. or Cooke et al.

DECISION

We affirm the Examiner's decision.

TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal maybe extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

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